

ANESTHESIA MANAGEMENT OF THE RHEUMATIC CARDIAC FOR MITRAL VALVULOTOMY*

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ANESTHESIA for the patient with rheumatic heart disease who is chosen as a candidate for valvulotomy demands an individualized regimen. The following discussion presupposes that the cardiologist working with the surgical team has the patient in the best possible condition, from a medical standpoint, that can be attained in view of the existing valvular disease.

The premedication of patients in our series has consisted of a combination of morphine and atropine given by the subcutaneous route one and one-half hours prior to the beginning of anesthesia. Morphine has been given in usual doses depending upon age, weight, and height of the individual's reflex irritability. Atropine has been used in small doses not exceeding 0.2 mgm. for fear of a moderate degree of vagal blockade. The increase in heart rate that may ensue will decrease the diastolic filling of the heart which may initiate cardiac failure. A small dose of atropine is still administered which will be partially effective in blocking the glands of the mouth and pharynx, thereby preventing secretions which could cause mild degrees of respiratory obstruction.

The anesthetic technique in all of these patients has been by closed circle carbon dioxide absorption endotracheal method with an inflated cuff to maintain a completely closed system. The anesthetic agent is 2½ per cent Pentothal Sodium, given until the patient no longer responds to spoken voice. This, in all cases, has been an extremely small dose, not exceeding 200 mgm. The face mask is then applied and anesthesia is induced with ether-oxygen using 50 per cent oxygen and 50 per cent nitrous oxide to accomplish the Pentothal-ether sequence. It was found early in our cases that as soon as the individual entered the third stage of surgical anesthesia great care had to be exercised to main-

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tain light planes of this stage of anesthesia. The intubation should be accomplished in the first plane of the third stage aided by the local spray to the larynx of topical 2 per cent xylocaine to minimize a bucking response on the endotracheal tube and the subsequent hypoxia that may be associated with this reflex. If the patients are anesthetized to deeper planes of anesthesia; that is, the second or third planes of the third stage, they will develop signs of peripherovascular failure manifested by cyanosis of the extremities, ear lobes, etc. A profound fall in blood pressure will occur which may seriously jeopardize the patient's chances for recovery. If a profound hypotensive episode occurs, it is probably wise to cancel the procedure rather than to begin surgery following this insult to the cardiovascular mechanism. The anesthetic agent for maintenance has been ether and oxygen. Other agents may be used and have been used successfully, but the maintenance of anesthesia must be carried on in the first plane of the third stage regardless of the agent. It should not be uncommon for the patient to move slightly during the operation. In all our cases, no patient has received more than 1 or $\frac{1}{2}$ ounce of ether for the entire induction and maintenance. The relaxant drugs have not been necessary. Assisted respiration is used while the chest is open but extreme care should be exercised in its use for fear of producing myocardial overdose with ether. Controlled respiration should not be used, in our opinion, for fear again of likelihood of overdose of anesthetic agent. There is also grave danger of impeding blood flow in the pulmonary system which is usually at borderline compensation in this group of patients.

We have found the Cambridge operating cardioscope to be of inestimable value in following the cardiac rate and rhythm in these cases. The continuous electrocardiogram allows the anesthesiologist to inform the surgeon when he is working in the areas of high irritability. These areas are most frequently associated with pressure in the vicinity of the descending branch of the left coronary artery. In early cases of this series, continuous intravenous procaine was administered and procaine was sprayed over the heart during surgery. It soon became apparent that the depressant effect of procaine on the ventricular muscle was of greater disadvantage than the advantage of preventing ventricular arrhythmias. Therefore, procaine has been eliminated in all of its forms for routine use and is reserved for only specific indications. The greatest number of cardiac irregularities occur during the manipulation of the

heart valve itself. The irregularities do not occur from the finger in the heart acting as a foreign body, but are related to movement of the finger. This is probably due to movement of the finger itself, or to distortion of the heart by the finger or knife during manipulation of the heart valve. It is quite comforting to know that, in the overwhelming majority of instances, as soon as the finger is held stationary in the auricle there is a very quick return to the pre-existing rhythm of the heart. At present, we do not attempt to stop the surgeon from manipulation of the valve unless ventricular tachycardia persists for thirty seconds or more or a persistent bizarre rhythm presents itself.

Blood replacement must be carefully controlled so as to replace only that blood which is lost. Circulatory overload occurs easily in these patients. Conversely, a decrease in blood volume may seriously incapacitate this damaged heart.

We have been impressed by the high incidence of severe postoperative pain which is now anticipated while the patient is still on the operating table by blocking the upper thoracic nerves in the paravertebral region with 2 cc. of efocaine. This procedure has greatly reduced the incidence of this severe chest pain. Despite relief of this intercostal pain, there may develop, in a period of weeks or months, a pain which is substernal in nature and which may radiate to the back and is aggravated by swallowing and deep breathing. We have been unable to effectively block this type of pain which is most likely pericardial in origin.